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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/872,052	05/31/2001	Robert S. Matson	1810A-045 (81841.0192)	8141
46267	7590	02/23/2005	EXAMINER	
HOGAN & HARTSON LLP 500 S GRAND AVE SUITE 1900 LOS ANGELES, CA 90071			LAM, ANN Y	
			ART UNIT	PAPER NUMBER
			1641	

DATE MAILED: 02/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/872,052	Applicant(s) MATSON ET AL.	
	Examiner Ann Y. Lam	Art Unit 1641	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on December 14, 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 55-71 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 55-71 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 55-61 and 63-71 are rejected under 35 U.S.C. 102(e) as being anticipated by Obremski et al., 6,110,749.

Obremski et al. disclose a plurality of biopolymer and a solid support (see column 2, lines 63-67), wherein the solid support has at least one surface comprising pendant acyl fluoride functionalities (see column 16, lines 64-67), and wherein an unmodified end of the biopolymer is attached to the solid support by reaction with the pendant acyl fluoride functionalities in the absence of a spacer arm (see column 16, lines 64-67.) The end of the biopolymer that is attached to the solid support is unmodified since Obremski does not disclose that the biopolymer must be modified in order to be attached to the solid support. Likewise, the attachment is performed in the absence of a spacer arm since Obremski does not disclose that a spacer arm is required in order for the biopolymer to be attached to the solid support by reaction with the pendant acyl fluoride.

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As to claim 56, the biopolymers are nucleic acids (see column 7, lines 39-47.)

As to claims 57 and 58, the biopolymers are polynucleotides (see column 7, lines 39-47.)

As to claim 59, the polynucleotide is single or double stranded DNA (see column 7, lines 39-47.)

As to claims 60 and 71, the biopolymers may be the same or different.

As to claim 61, the solid support is of polymeric materials (see column 16, line 64.)

As to claim 63, the solid support is in the form of films (see column 16, line 33.)

As to claim 64, the solid support is fabricated from plastic in the form of a planar device having discrete isolated areas in the form of wells (see column 6, lines 65-66.)

As to claim 65, the solid support is considered a microplate.

As to claim 66, the plastic is a surface treated with acyl fluoride functionalities (see column 16, lines 64-67.)

As to claim 67, the plastic is polypropylene (see column 16, line 64.)

As to claims 68-70, the biopolymers are attached to different, discrete, isolated areas to form an array (see column 2, lines 63-67.)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claim 62 is rejected under 35 U.S.C. 103(a) as being unpatentable over Obremski et al., 6,110,749, in view of Lindall, 5,470,307.

Obremski teaches the invention substantially as claimed (see above with respect to claim 55.)

More specifically, Obremski teaches that biopolymers, including proteins (column 16, lines 39-40) and oligonucleotides (column 16, lines 64-65), are attached to a solid support (see column 16, lines 39-40 and lines 64-67.) Furthermore, Obremski teaches that the solid support (i.e., waveguide) is generally made of a plastic material (col. 1, lines 45-46), and need not be made of optical quality material and can be made of relatively inexpensive plastic sheet (col. 6, lines 25-27.) Obremski specifically teaches in an example on column 16, line 64, that the solid support is made of polypropylene film.

However, Obremski does not teach that the polypropylene is carboxylated.

Lindall teaches a polymer support surface (14) that is made of carboxyl-modified polypropylene and has proteins (column 8, line 4 and column 17, lines 4-5) or nucleotides (column 8, line 5) coupled to it. It would have been obvious to one of ordinary skill in the art to substitute polypropylene with carboxyl-modified polypropylene as the material to form the Obremski waveguide since Lindall discloses that carboxyl-modified polypropylene is a useful plastic material to which proteins and nucleotides may be coupled.

3. Claims 55-71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barany et al., 6,852,487, in view of Matson, 6,037,124.

Barany et al. discloses a plurality of biopolymer and a solid support (col 23, line 21), wherein the solid support has at least one surface comprising pendant acyl halide functionalities (col. 23, line 23), and wherein an unmodified end of the biopolymer is attached to the solid support by reaction with the pendant acyl halide functionalities in the absence of a spacer arm, (col. 26, lines 36-39, and col. 23, lines 20-23, disclosing the attachment of pre-synthesized probes.)

As to claim 56, the biopolymers are nucleic acids (col. 26, line 37.)

As to claims 57 and 58, the biopolymers are polynucleotides (col. 26, line 37.)

As to claim 59, the polynucleotide is single or double stranded DNA (col. 26, line 37.)

As to claims 60 and 71, the biopolymers may be the same or different.

As to claim 61, the solid support is of polymeric materials (col. 22, line 33.)

As to claim 62, the solid support is carboxylated PVDF, carboxylated polypropylene or carboxylated polyethylene, (col. 22, lines 14-16 and lines 51-52.)

As to claim 63, the solid support is in the form of films (col. 22, line 1.)

As to claim 64, the solid support is fabricated from plastic in the form of a planar device having discrete isolated areas in the form of wells (col. 22, lines 1-7.)

As to claim 65, the solid support is considered a microplate (col. 22, lines 6-7.)

As to claim 67, the plastic is polypropylene (col. 22, line 16.)

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As to claims 68-70, the biopolymers are attached to different, discrete, isolated areas to form an array (col. 9, lines 42-44.)

Although Barany et al. teaches that the surface of the solid substrate is functionalized with binding members, such as acyl halide (col. 22, lines 36-40), Barany et al. does not specifically disclose that the halide is fluoride (as claimed in claim 55 and 66.) Matson '124 however teaches functionalizing solid substrates, such as polymer substrates, with acyl fluoride (col. 5, lines 50-54) for immobilization of oligonucleotides and other biomolecules. It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize acyl fluoride in the Barany et al. method, as taught by Matson, as the acyl halide generally disclosed by Barany et al., because Matson teaches that acyl fluoride provides the advantage of functionalizing a solid substrate such as the Barany et al. polymer solid substrate in order to immobilize biomolecules.

Response to Arguments

Applicant's arguments with respect to the rejections have been fully considered but they are not persuasive.

Applicant submitted a Declaration confirming that Robert S. Matson provided Obremski with the oligonucleotides that were covalently coupled to the waveguide using acyl fluoride coupling and that the oligonucleotides were amino-modified.

However, the declaration does not provide any actual evidence that the oligonucleotides that were used by Obremski in the '749 invention were unmodified.

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Examiner suggests a signed affidavit from Obremski that the oligonucleotides that were used were unmodified.

Applicant also maintains that it is generally understood in the art that the attachment of biopolymers via available terminal amino groups may lead to inefficient and unstable attachment or to reduced activity of the attached biomolecule, and thus, in the absence of data to the contrary, a person of ordinary skill in the art would assume that a modification of the oligonucleotide took place before the covalent attachment was performed.

In response, Examiner reasserts that in the absence of a teaching that the biopolymer must be modified in order to be attached to the solid support, one of ordinary skill in the art would not modify the biopolymer. Barany et al. does not disclose that the biopolymer must be modified in order to be attached to the solid support, but rather teaches that pre-synthesized probes may be attached to the solid support (col. 26, lines 36-39.)

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ann Y. Lam whose telephone number is 571-272-0822. The examiner can normally be reached on M-Sat 11-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on 571-272-0823. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A.L.



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PRIMARY EXAMINER
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2/20/05